

# Instructions for Completing A PWS-6 Report For Community or Non-Community Non-Transient Public Water Supplies

(Revised - 12/23/2002)

The Source Water Delineation and Assessment Reports (SWDAR) for community or non-transient non-community public water supplies should include the sections outlined below and must adequately describe the water supply, the aquifer or surface water source, and potential sources of regulated contaminants. In addition to the text pages, several simple maps should be included to show the well(s), on-site structures, water distribution system, sewage disposal, roads, source water protection regions (described below – Table 1), general land uses, and potential sources of regulated contaminants (See Attached Example Report). If a well log is available, a copy should also be included with the report (**Note-well log must be submitted before final approval can be given**). For more information and guidance on completing the tables shown below, please refer to the Montana Source Water Protection Program document (MT SWPP) at <http://www.deq.mt.gov/wqinfo/swp/Index.asp> or contact the Source Water Protection Program at (406) 444-6697. Another resource to help you create maps of potential contaminants to include in the PWS-6 report is the Spatial Query and Mapping System (see <http://nris.state.mt.us/mapper/>).

## SWDAR Outline

- 1. INTRODUCTION AND PURPOSE:** Include the public water supply (PWS) name, address, primary contact person, telephone number, and date of report. Identify who completed this report and include contact information. If part of a planned subdivision, provide plot layout map, DEQ review engineer name, and date of subdivision plan submittal. If part of existing subdivision include plot approval statement and relevant support figures.
- 2. PWS INFORMATION:** Describe the location and nature of the water supply (i.e. town, subdivision, school, etc). If this is a new source at an existing PWS, describe why it is needed. Identify how many individuals the PWS will serve and the actual or projected water demand in gallons per day, (see tables in EPA, 1991). Describe and show the exact locations of the well or surface water intake with respect to the on-site sewage collection and treatment system serving this PWS.
- 3. DELINEATION:** Source water protection areas define the land area that contributes water to the public water supply well or surface water intake. Use the following headings within this section of the report. **Hydrologic Conditions:** Use Table 1 to determine which set of source water protection regions are required for the water supply. Show the protection region boundaries on one or more of the maps. Describe the aquifer or surface water source sufficiently to justify your delineation and to assign a sensitivity rank (see Table 2). Use Table 3 to list geologic reports and maps used to describe the hydrologic conditions. **Conceptual Model & Assumptions:** Include a diagram depicting a conceptual model for ground-water flow for this public water supply. Describe uncertainty in your estimates of aquifer properties, hydraulic boundaries, pumping rate, etc. Also, are the assumptions made in your conceptual model consistent with hydrogeologic conditions? **Well Information:** Use Table 4 to list pertinent information and attach logs if available. **Aquifer Properties:** Use Table 5 to list aquifer properties, especially if time-of-travel calculations are used to delineate the inventory region. Describe source water quality available.
- 4. INVENTORY:** Describe and show ownership of the control zone. Describe and show general land uses within the control and inventory regions. On the map, show general land uses described as: sewer residential, sewer commercial, sewer mixed, unsewer residential, unsewer mixed, unsewer commercial, industrial, railroad right-of-way, highway right-of-way, agricultural dryland crop, agricultural irrigated crop, agricultural irrigated pasture, agricultural dryland pasture, or forest. Table 6 shows land use codes that can be used on the map. You can use the Montana Mapper to build maps showing significant potential sources of contamination within the inventory region. Use Table 7 to identify the types of significant potential contaminant sources you should identify. Use Table 8 to list each source.
- 5. SUSCEPTIBILITY:** Describe the risk the contaminant sources identified in your inventory pose to the new well. The following procedure is an example of a simple susceptibility analysis that can be used. Use of this procedure is encouraged but not required.

Use Table 9 to assign a hazard rating for each potential contaminant source you have listed in Table 8. See Appendix J (Section F4 and Tables J6 & J7) in the MT SWPP document for additional guidance.

Use Table 10 and information from Appendix J (Section F4) to help you identify natural or man-made barriers for each source and to assign susceptibility ratings for each source listed in Table 8. Only barriers described in Appendix J Section F4 can be credited in the susceptibility assessment.

In the text, describe any other source water protection efforts that will be used to address and minimize the susceptibility ratings listed in Table 8. Finally, discuss water treatment measures already being used by the PWS.
- 6. LIMITATIONS**

Identification of potential contaminant sources is limited to those regulated for this class of PWS and is generally based on readily available information and reports. Unregulated activities or unreported contaminant releases may not be considered in this report. The delineation method utilizes simplifying assumptions that may not fully represent complex ground water flow systems but is intended to be conservative and protective of public health.
- 7. REFERENCES:** List other references used for this report. You do not need to duplicate the study and map references listed previously in Table 3. Table 11 shows the suggested reference format.

## Support Figures

**Table 1. Methods and criteria for delineating source water protection regions for PWSs.**

<b>If Your Source of Water Is:</b>	<b>Delineate These Water Protection Regions</b>	<b>Method For Each Region:</b>	<b>Minimum Distance Values &amp; Type of Inventory Required: LU – Land Uses; P&amp;N – Pathogens and Nitrate sources</b>
<ul style="list-style-type: none"> <li>Unconfined / Semi-confined/Leaky-confined</li> </ul>	<ul style="list-style-type: none"> <li>- Control</li> <li>- Inventory</li> <li>- Recharge</li> </ul>	<ul style="list-style-type: none"> <li>-Fixed radius</li> <li>-Time-Of-Travel Calculation</li> <li>- Hydrogeologic Mapping</li> </ul>	<ul style="list-style-type: none"> <li>-Distance - 100 feet</li> <li>- Distance - Larger of 1,000 feet up-gradient or 3-year TOT (plus half-mile buffer around hydraulically connected surface water for 10 miles upstream*)</li> <li>-Physical and Hydrologic flow boundaries</li> </ul>
*Ground Water that is hydraulically Connected to Surface Water	-Surface Water Buffer Zone	- Fixed radius	-One-half mile buffer extending upstream a distance corresponding to a 4-hour TOT but not to exceed ten miles or the nearest intake. Buffer will not exceed the extent of the watershed.
<ul style="list-style-type: none"> <li>Confined</li> </ul>	<ul style="list-style-type: none"> <li>- Control</li> <li>- Inventory</li> <li>- Recharge</li> </ul>	<ul style="list-style-type: none"> <li>-Fixed Distance</li> <li>- Fixed radius</li> <li>- Hydrogeologic Mapping</li> </ul>	<ul style="list-style-type: none"> <li>-Distance - 100 feet</li> <li>-Distance - Minimum of 1000 feet</li> <li>- Physical and Hydrologic flow boundaries</li> </ul>
<ul style="list-style-type: none"> <li>Surface water</li> </ul>	Spill Response	Fixed Distance	One-half mile buffer extending upstream a distance corresponding to a 4-hour TOT but not to exceed ten miles or the nearest intake. Buffer will not exceed the extent of the watershed.

**Table 2. Source Water (Aquifer) Sensitivity Table.**

<b><u>High Source Water Sensitivity</u></b>	<b><u>Moderate Source Water Sensitivity</u></b>	<b><u>Low Source Water Sensitivity</u></b>
<ul style="list-style-type: none"> <li>Surface water and GWUDISW</li> <li>Unconsolidated Alluvium (unconfined)</li> <li>Fluvial-Glacial Gravel</li> <li>Terrace and Pediment Gravel</li> <li>Shallow Fractured or Carbonate Bedrock</li> </ul>	<ul style="list-style-type: none"> <li>Semi-consolidated Valley Fill sediments (semi-confined)</li> <li>Unconsolidated Alluvium (semi-confined)</li> </ul>	<ul style="list-style-type: none"> <li>Consolidated Sandstone Bedrock</li> <li>Deep Fractured or Carbonate Bedrock</li> <li>Semi-consolidated (confined)</li> </ul>

**Table 3. List of geologic or hydrogeologic maps available for the area.**

<b>Title or Description</b>	<b>Date</b>	<b>Area Covered</b>	<b>Reference</b>

**Table 4.** Source well information for *public water supply name*.

Information	Well #1	Well #2
PWS Source Code		
Well Location (T, R, Sec or lat, long)		
MBMG #		
Water Right #		
Date Well was Completed		
Total Depth		
Perforated Interval		
Static Water Level		
Pumping Water Level		
Drawdown		
Test Pumping Rate		
Specific Capacity		

**Table 5.** Estimates of aquifer properties and pumping demand.

Input Parameter	Range of Values and units	Values Used (for each well if more than one)			
		Well #1	Well #2	Well #3	Well #4
PWS Source Code					
Transmissivity					
Thickness					
Hydraulic Conductivity					
Hydraulic Gradient					
Flow Direction					
Effective Porosity					
Pumping Rate					
3-Year TOT Distance					

**Table 6.** Land Use Types and Map Codes.

Land Use Type	Map Code	Land Use Type	Map Code
Sewered residential	SR	Industrial	I
Sewered commercial	SC	Railroad right-of-way,	RRW
Sewered mixed	SM	Highway right-of-way	HRW
Unsewered residential	UR	Agricultural dryland crop	ADC
Unsewered mixed	UM	Agricultural irrigated crop	AIC
Unsewered commercial	UC	Agricultural irrigated pasture	AIP
		Agricultural dryland pasture	ADP
		Forest	F

**Table 7. Identification of Significant Potential Contaminant Sources.**

Septic Systems Animal Feeding Operations Underground Storage Tanks Underground Storage Tanks Leaks State and Federal Superfund Sites RCRA Large Quantity Generators Underground Injection Wells Wastewater Treatment	Landfills Abandoned Mines MPDES Wastewater Dischargers Municipal Sanitary Sewer Municipal Storm Sewers Highways, Railways, Pipelines Cultivated Croplands <b>Other:</b> Activities or substances that can compromise source water quality.
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**Table 8. (MT SWPP Table 5). Significant potential contaminant sources for *enter PWS name*. (Examples included)**

Source	Contaminants	Description ( <i>Location and nature of hazard</i> )	Hazard Rating	Barriers	Susceptibility
<i>Animal Feeding Operation</i>	<i>Pathogens and Nitrates</i>		<i>Moderate</i>		
<i>Sanitary Sewer Main</i>	<i>Pathogens and Nitrates</i>				
<i>Septic Systems</i>	<i>Pathogens and Nitrates</i>				
<i>Underground Pipeline</i>	<i>Fuels</i>				

**Table 9a. (MT SWPP Table 6) SURFACE WATER SOURCES: Hazard of potential contaminant sources.**

Potential Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
<b>Point Sources</b>	Potential for direct discharge to Source Water	Potential for discharge to GW that is hydraulically connected to SW	Potential contaminant sources present within the watershed
<b>Septic Systems</b>	More than 300 per sq. mi.	50 – 300 per sq. mi.	Less than 50 per sq. mi.
<b>Municipal Sanitary Sewer</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
<b>Cropped Agricultural Land</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region

**Table 9b. (MT SWPP Table 6) UNCONFINED AQUIFERS: Hazard of potential contaminant sources.**

Potential Contaminant Source	High Hazard	Moderate Hazard	Low Hazard
<b>Point Sources</b>	Within 1 year TOT	Between 1 to 3 years TOT	Over 3 years TOT
<b>Septic Systems</b>	More than 300 per sq. mi.	50 – 300 per sq. mi.	Less than 50 per sq. mi.
<b>Municipal Sanitary Sewer</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region
<b>Cropped Agricultural Land</b> (percent land use)	More than 50 percent of region	20 to 50 percent of region	Less than 20 percent of region

**Table 9c. CONFINED AQUIFERS (modified from MT SWPP Table 6): Hazard of potential contaminant sources.**

Potential Contaminate Sources	The PWS well is not sealed through the confining layer	Other wells in the inventory region are not sealed through the confining layer	All wells in the inventory region are sealed through the confining layer
<b>Point Sources</b>	High	Moderate	Low
<b>Septic Systems</b> (# per square mile)	High: > 300 Moderate: 50 to 300 Low: < 50	Moderate: > 300 Low: < 300	Low
<b>Sanitary Sewer</b> (% land use)	High: > 50 Moderate: 20 to 50 Low: < 20	Moderate: > 50 Low: < 50	Low
<b>Cropland</b> (% land use)	High: > 50 Moderate: 20 to 50 Low: < 20	Moderate: > 50 Low: < 50	Low

**Table 10. (MT SWPP Table 5). Relative susceptibility to specific contaminant sources as determined by hazard and the presence of barriers.**

Presence Of Barriers	Hazard		
	High	Moderate	Low
<b>No Barriers</b>	Very High Susceptibility	High Susceptibility	Moderate Susceptibility
<b>One Barrier</b>	High Susceptibility	Moderate Susceptibility	Low Susceptibility
<b>Multiple Barriers</b>	Moderate Susceptibility	Low Susceptibility	Very Low Susceptibility

**Table 1. Suggested format for listing references.**

Author Name, Date of Publication, Title of Report or Document: Publication Source and Report or Volume Number, page number.

**Example:**

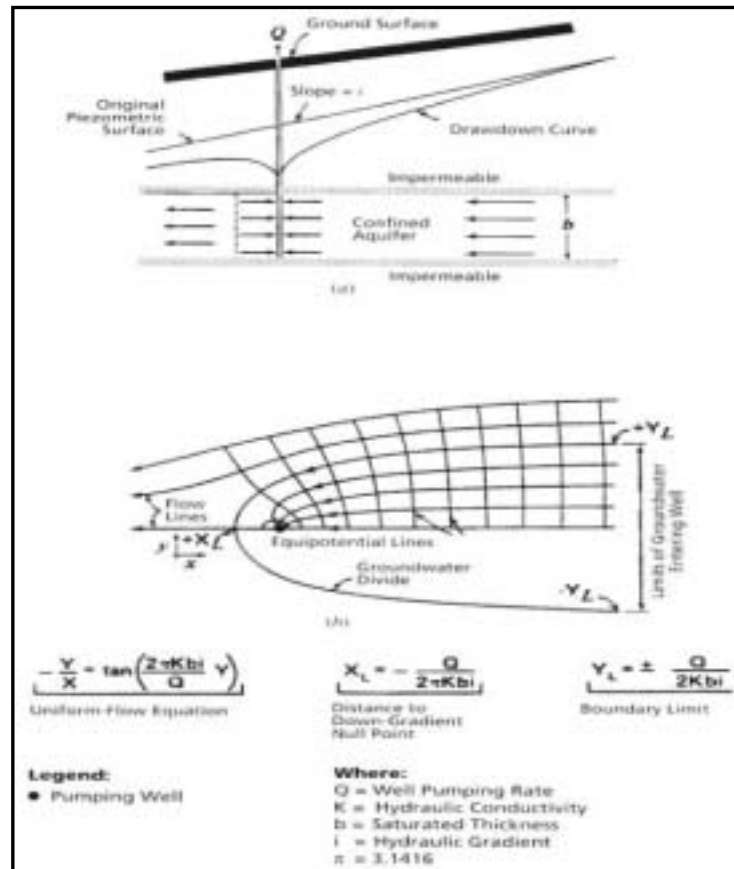
- Kendy, E., and R.E. Tresch, 1996, Geographic, Geologic, and Hydrologic Summaries of Intermontane Basins of the Northern Rocky Mountains, Montana: U.S. Geological Survey Water Resources Investigations Report 96-4025, 233 p.
- Morrison – Maierle, Inc.. 1980. Flower Creek Basin Flower Creek Dam Libhv. Montana. MT-1458. 23 p.

## APPENDIX A

### TIME-OF-TRAVEL CALCULATIONS

#### UNIFORM GROUND-WATER FLOW EQUATION

Flow to a well penetrating a confined aquifer having a sloping plane piezometric surface - vertical section and plan view (Todd, 1980).



#### TIME-OF-TRAVEL CALCULATION METHOD

The time of travel for water to move along a line parallel to the hydraulic gradient, from a point to a pumping well (EPA 1991).

$$T_x = \frac{n}{Ki} \left[ X_L - \frac{Q}{2\pi Kbi} \ln \left( 1 + \frac{2\pi Kbi}{Q} X_L \right) \right]$$

$T_x$	=	travel time from point x to a pumping well
$n$	=	porosity
$X_L$	=	distance from pumping well over which ground water travels in $T_x$
$Q$	=	discharge
$K$	=	hydraulic conductivity
$b$	=	aquifer thickness
$i$	=	hydraulic gradient

# ExamplePWS-6 Report

## Town of Sheridan

June 1, 2001

**Public Water Supply: PWS ID: 00329**  
**Town of Sheridan**

### INTRODUCTION AND PURPOSE

The purpose of this PWS-6 report is to assess threats to a new supply well for the Sheridan water supply system. The primary contact for this water supply is Mr. Kelly Elser, P.O. Box 78, Sheridan, Mt. 59749. Jim Stimson, Hydrogeologist with the Montana Department of Environmental Quality (DEQ), prepared the final report. Details on this water supply were obtained from a review of the Public Water Supply files, the most recent sanitary survey completed June 14, 1999, a draft preliminary ground-water report provided by the Ruby Valley Conservation District, memos and well test data from Damschen-Entranco, and other public sources of information.

### LIMITATIONS

The terms "drinking water supply" or "drinking water source" refer specifically to the source of the Sheridan public water supply and not any other public or private water supply. Only significant potential sources of contamination in areas that contribute water to the drinking water source are considered in this report. A source is considered significant if substances that are used, generated or stored are highly hazardous to human health or if the volume on-site is relatively large. Some potential or existing sources of contamination may be unintentionally missed in the inventory. The report will be periodically updated when new information becomes available. The term "contaminant" is used in this report to refer to constituents for which maximum concentration levels (MCLs) have been specified under the national primary drinking water standards, and to certain constituents that do not have MCLs but are considered to be significant health threats.

### PWS INFORMATION

Sheridan is located in lower Ruby Valley in Madison County along State Highway 287, about 36 miles northeast of Dillon (Figure 1A). DEQ public water supply records indicate the water system serves 723 residents and is classified as a community system because it serves at least 25 year-round residents. Public water and sewer services are provided within the city limits. A waste treatment lagoon is located about one-quarter mile northwest of town (Figure 1B).

The primary water supply consists of four wells located in a well field on the west-side of town (Figure 1B). Use of one of the wells is limited due to construction problems. Water from the well field is pumped to two storage reservoirs northeast of town near Nonpareil Creek and then re-routed through a variety of service connections to Sheridan residents.

Average water use is estimated at 183 gallons per minute (gpm), that is 263,520 gallons per day (gpd), with peak demand estimated at 329 gpm (473,760 gpd) during the summer. The water is not disinfected but the system is equipped to provide gas chlorination. Concerns over water supply shortages due to drought conditions during the summer of 2000 and chronic production problems with the number 4 well prompted efforts to drill the new supply well. The new well will be located in the existing well field and therefore, information from the existing wells will be used to develop a conceptual model for ground-water flow for the new well and to estimate aquifer properties.

### DELINEATION

Three source water protection zones are delineated for the Sheridan water supply well. They include a 100-foot fixed radius control zone, a 3-year Time-Of-Travel (TOT) inventory region, and a recharge region based on the watershed contributing water to the Sheridan area.

#### Hydrologic Conditions

Hydrogeologic studies indicate that Quaternary and Tertiary sedimentary deposits are the source of Sheridan's water supply. The majority of the wells in the vicinity of Sheridan are between 15 and 60 feet deep. These wells tap a shallow water table aquifer within the Quaternary alluvium. The town's public supply wells are between 100 and 412 feet deep and production is from shallow Quaternary alluvium and deeper zones within the upper Tertiary sedimentary deposits. Geologic cross-sections from a preliminary ground-water study show that multiple confining clay layers are present in the area but in some places these layers thin and terminate. In other words, the confining layers are not laterally extensive.



# Sheridan Public Water Supply Figure 1.

Figure 1A



Figure 1B

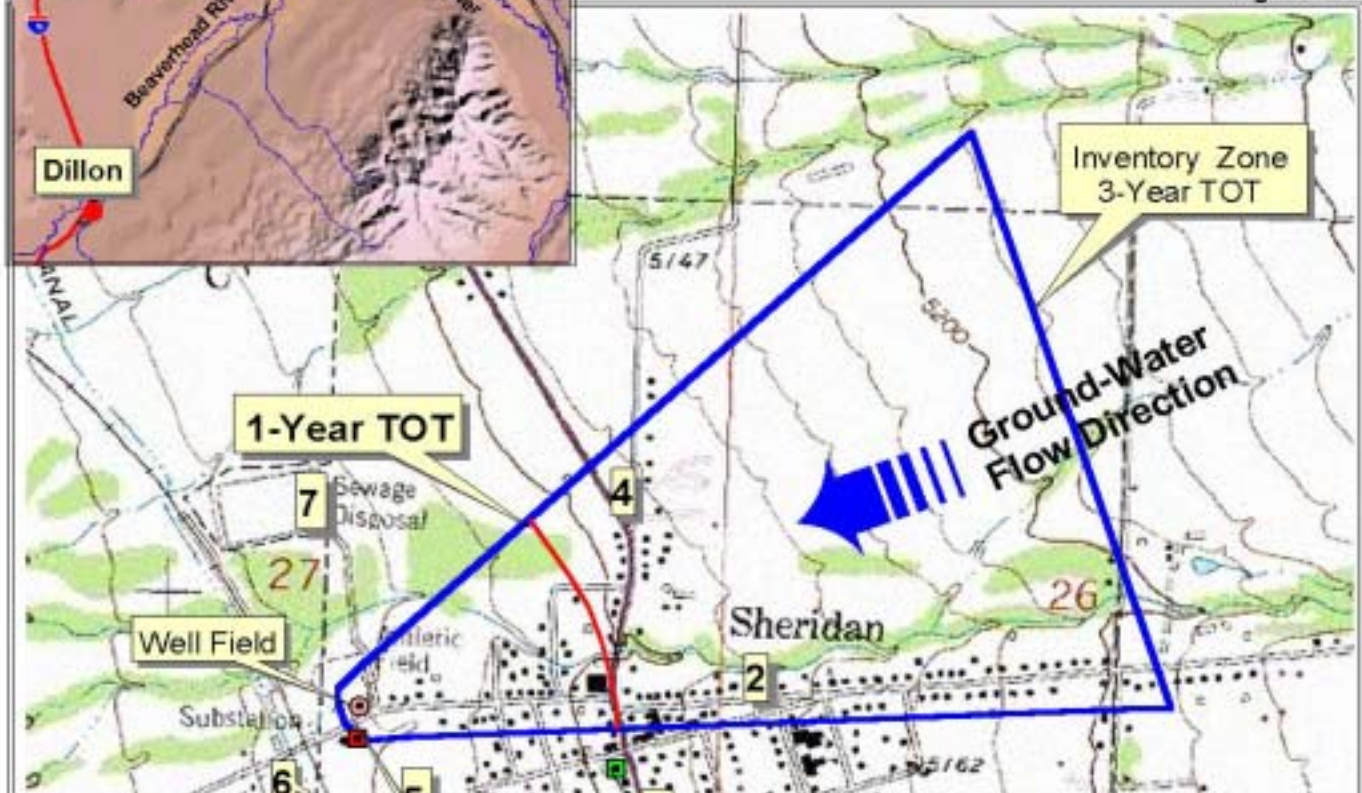
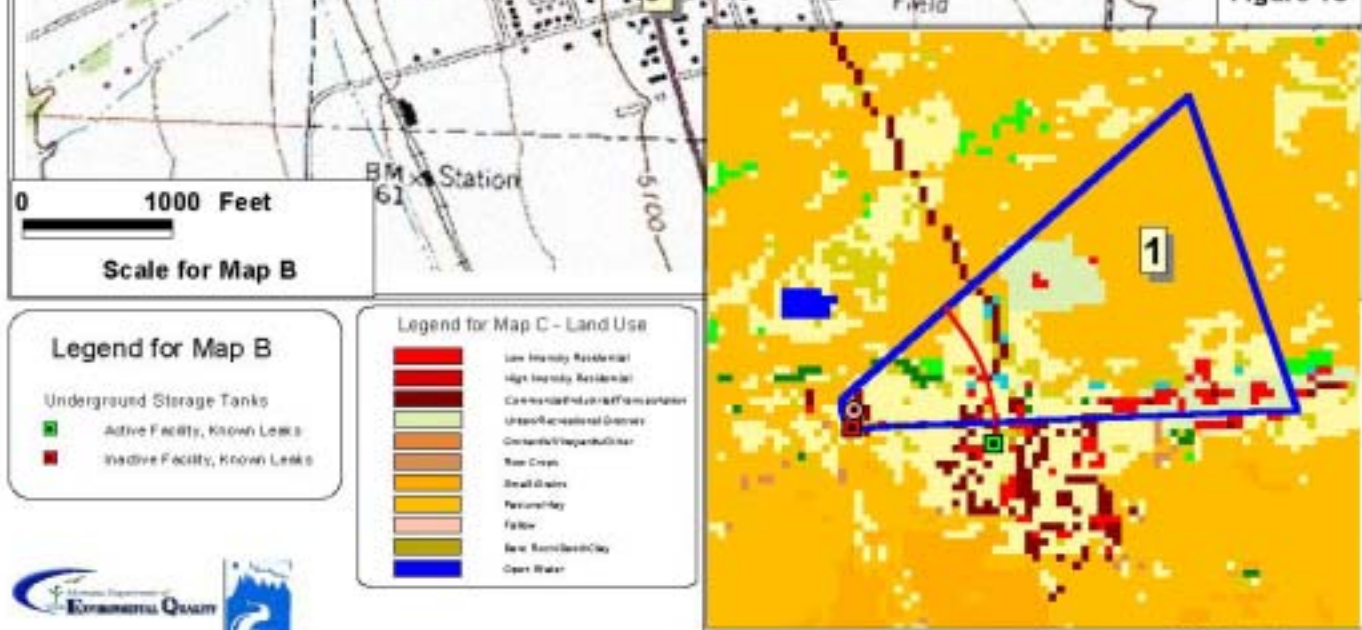


Figure 1C





Therefore, the aquifer used by the Sheridan water supply is interpreted to be semi-confined, and is assigned a rank of "moderate source water sensitivity", in accordance with Table 2 of the PWS-6 template for Community or Non-Community Non-Transient Public Water Supplies (DEQ Source Water Protection Program, 2000).

#### Conceptual Model and Assumptions

Sheridan is located on an alluvial fan that originates at the Tobacco Root Mountain front and slopes southwest toward the Ruby River floodplain (Figure 1B). Ground-water flow is generally to the southwest away from the mountain front and toward the Ruby River. As a consequence, the potential contaminant sources located northeast of Sheridan's well field are the focus of the inventory, hazard assessment, and susceptibility analysis presented in this report.

#### Well Information

Table 1 shows that Sheridan's public water supply wells range in depth from 100 to 412 feet. Two wells located in the well field west of Sheridan encountered 40 to 100 feet of "hard pan" or "clay" that can be interpreted as impermeable confining layers. The deeper wells are perforated below the "clay" layers. However, Well 4 is perforated in both the shallow and deeper aquifer, creating a pathway between the two and compromising the confining layers. This well essentially provides a pathway from the shallow aquifer to the deeper aquifer for potential contaminants. This well will be plugged and abandoned as soon as the new well is brought on line (Kelly Elser, Personal Communication, 2-5-2001). This action will help reduce the threat from potential contaminant sources in the vicinity of the well field and within the inventory zone.

#### Aquifer Properties

Table 2 summarizes aquifer information for the Sheridan area. The table includes parameter values used in TOT calculations to delineate the inventory zone (Figures 1B and C).

#### Limitations

Values in Table 2 come from a limited number of studies conducted in the lower Ruby Valley. As a consequence, it is uncertain how accurately the values portray the aquifer's properties. The width of the inventory zone was expanded to include a 45 degree arc to help compensate for uncertainties and seasonal variations in the ground-water flow direction. Calculated TOT distances are considered to be conservative estimates based on available data and the professional judgement of the analyst writing this report.

### **INVENTORY**

Table 3 lists the significant potential contaminant sources for the control and inventory zones. Numbers in the source column of the table provide a cross-reference to maps shown in figures 1B and 1C. Recreation, hay production, and grazing are the primary land uses near the well field. Based on an analysis of the USGS National Landcover Dataset (USGS 2000), land use within the entire inventory zone is approximately 52% agriculture, 18% undeveloped residential, 23% grassland, 4% low-density residential, and 3% commercial. Land use in the recharge region is dominated by grass- and shrub-land (56%), forestland (32%), and agricultural land (11%).

Two former fuel leak sites are included in the inventory, despite the fact they lie just outside the inventory zone boundary. They are included because the inventory boundary is delineated based on incomplete information, and there are uncertainties concerning aquifer properties and ground-water flow direction. Modification of the inventory zone boundary to include both sites could be warranted if future studies indicate these areas contribute water to the Sheridan supply wells.

The railway, which would normally be considered a significant potential contaminant source, is not included in the inventory and susceptibility analysis because it is abandoned.

### **SUSCEPTIBILITY**

The susceptibility of the proposed well to contamination is assessed in this section. The proximity of a potential contaminant source to the well site or the density of non-point potential contaminant sources determines the threat of contamination. Hazard and the existence of barriers to contamination determine susceptibility; see Table 11 of the PWS-6 template (Montana DEQ, 2000). Barriers can be anything that decreases the likelihood that contaminants will reach a well. Barriers can be engineered structures, management actions or natural conditions. Examples of engineered barriers are spill catchment structures for industrial facilities and leak detection for underground storage tanks. Emergency planning and best management practices can be considered management barriers. Thick clay-rich soils, a deep water table or a thick saturated zone above the well intake can be natural barriers.

Table 3 lists results from the susceptibility analysis for significant potential contaminant sources. The susceptibility assessment is based on criteria in Table 9 of the PWS-6 template (DEQ, 2000). Agricultural lands northeast of Sheridan make up about 52% of the inventory zone and are assigned a very high hazard rank.

Municipal sewer lines within Sheridan City Limits are ranked as a high hazard because they underlie 20 to 50% of the inventory zone. Two former leaking underground storage tank sites are given high hazard ratings. They are the Sheridan Service Station and Bulk Station.

A segment of Highway 287 is within a one-year time of travel of the well field (Figure 1B) and is initially ranked as a very high hazard. However, Mill Creek can be considered as a natural barrier to spills on the highway within the inventory zone. In addition, Sheridan has an emergency response plan to facilitate rapid response to spills on the highway. With these multiple barriers, the hazard rank is reduced to moderate.

## REFERENCES

- DEQ Source Water Protection Program, 2000, PWS-6 Template for Community or Non-Community Non-Transient Public Water Supplies. Available from the DEQ web site: <http://www.deq.state.mt.us/wqinfo/SWP/Circulars.htm>
- Hannaman, D. L. and Wideman, C. J., 1988, Sequence stratigraphy of Cenozoic rocks; Geologic Society of American V. 103, p. 1335-1345.
- Kuenzi, W.D. and Fields, R. W., 1971, Tertiary stratigraphy, structure, and geologic history of the Jefferson Basin, Montana; Geologic Society of American V. 82, p. 3374-3394.
- Ruppel, E. T., 1993, Cenozoic tectonic evolution of South West Montana and East-Central Idaho, Montana Bureau of Mines and Geology (MBMG) Memoir 65.
- Ruby Valley Conservation District in association with the Ruby Valley Watershed Committee, 2000, Preliminary report on the ground-water resources of the Mill and Indian Creek subwatershed, lower Ruby Valley, Montana. Draft Hydrogeologic Report, Madison County Conservation District.
- U.S. Geological Survey, 2000. National Landcover Dataset, Montana. 30-meter electronic digital landcover dataset interpreted from satellite imagery.

**Table 1.** Source well information for City of Sheridan. Source: MBMG GWIC. (Table 4 of template). NR = Not Reported

Well Information	Well # 1	Well # 2	Well # 3	Well #4	City Well	City Well (Tolson Well)
<b>PWS Source Code</b>	03	02	05	NR	NR	NR
<b>Well Location (T, R, Sec or lat, long)</b>	04S 05W 27 DB	04S 05W 26 CCDA	04S 05W 27 DB	04S 05W 27 DB	04S 05W 27 DA	04S 05W 26 CDA
<b>MBMG #</b>	107982	107951	107984	107983	107980	107954
<b>Water Right #</b>	NR	NR	NR	NR	NR	NR
<b>Date Well was Completed</b>	01/01/89	11/28/89	01/03/90	01/01/89	01/01/82	01/01/67
<b>Total Depth (ft)</b>	100	225	412	400	300	58
<b>Perforated Interval (ft)</b>	NR	81 - 225	250 -412	NR	NR	NR
<b>Static Water Level*</b>	18	20	22	16	9	8
<b>Pumping Water Level *</b>	NR	220	NR	NR	97	44
<b>Drawdown (ft)</b>	NR	200	NR	NR	88	36
<b>Test Pumping Rate (gpm)</b>	50	30	300	500	80	125
<b>Specific Capacity</b>	NR	0.15	NR	NR	0.91	3.47

\* feet below land surface

**Table 2.** Estimates of aquifer properties and pumping demand. (Table 5 of template)

Input Parameter	Values used for TOT Calculations	Range of Values from Sheridan wells	
		Well # 3	Well #2
PWS Source Code		05	02
Transmissivity (gpd/ft)	18,000	14,000 - 18,000	14,000 - 18,000
Thickness (ft)	103	62	144
Hydraulic Conductivity (gpd/ft <sup>2</sup> )	175	226 - 290	97 - 125
Hydraulic Gradient	0.02	NR	NR
Flow Direction	South-Southwest (S 70 - 75 W)	NR	NR
Effective Porosity	0.1	NR	NR
Pumping Rate (gpd)	368,640 Average of 263,520 and 473,760 reported on page 1 of text.	300 gpm	30gpm
Stagnation Point Distance (ft)	165		
Lateral Boundary Limit (ft)	520		
1-Year TOT Distance (ft)	1,679		
3-Year TOT Distance (ft)	5,037		

**Table 3.** (MT SWPP Table 5). Significant potential contaminant sources for City of Sheridan Source Water.

Source	Contaminants	Description ( <i>Location and nature of hazard</i> )	Hazard Rating	Barriers	Susceptibility
1. Dryland Agricultural Crop Lands and grazing	SOC, Nitrate	52% ag-land in the inventory zone	High	None	Very High
2. Sanitary Sewer Main	Pathogens & Nitrates	Inventory zone is about 50% sewer	Moderate	None	High
3. Leaking Underground storage site (LUST)	Gasoline	Just outside inventory zone	Moderate	None	High
4. Highway Crossing	Hazardous Materials (VOCs & SOCs)	About 700 feet is within inventory zone	High	-Mill Creek -Emergency Plan	Moderate
5. Underground storage site (UST)	Gasoline	Just outside inventory zone	Moderate	None	High
6. Class V Injection Well	Various organic chemicals	Unverified	Unknown	Unknown	Not Determined